

CONTENTS

Preface

N. Kosugi

The UVSOR Facility: A Short Appraisal

A. M. Bradshaw

Current Status of Light Source and Beam Lines

Light Source in 2001

1

M. Katoh

Beamlines in 2001

9

E. Shigemasa

UVSOR BeamLines

15

Research Activities

1. Accelerators and Beam Physics

New BPM System

37

K. Hayashi, M. Katoh, M. Hosaka, A. Mochihashi, T. Kinoshita, J. Yamazaki,
Y. Takashima, T. Honda and S. Koda

Development of Combined-Function Focussing Magnet

39

J. Yamazaki, M. Katoh, Y. Hori, M. Hosaka, A. Mochihashi, T. Kinoshita, K. Hayashi,
Y. Takashim, and S. Koda

Vertical Instability in Multi Bunch Operation in UVSOR

41

A. Mochihashi, K. Hayashi, M. Hosaka, M. Katoh, T. Kinoshita, J. Yamazaki, and
Y. Takashima

Feasibility Study of Generation of Ultrashort Pulses of Synchrotron Radiation at UVSOR

43

Y. Takashima, M. Katoh, M. Hosaka, A. Mochihashi, T. Honda, T. Kinoshita,
J. Yamazaki, K. Hayashi and Y. Hori

Improvement of Out-coupled Power of the UVSOR-FEL

45

M. Hosaka, S. Koda, A. Mochihashi, M. Katoh, J. Yamazaki, K. Hayashi,
Y. Takashima, T. Gejo, E. Shigemasa, E. Nakamura and H. Hama

In-Vacuum Undulator for UVSOR BL-7A

47

A. Mochihashi, K. Hayashi, M. Hosaka, M. Katoh, T. Kinoshita, J. Yamazaki,
Y. Takashima, H. Kitamura, T. Hara, T. Tanaka

2. Instrumental Developments

<i>Carbon Contamination of SR Mirror</i>	49
E. Nakamura, M. Tadano, H. Sakai, N. Terunuma, M. Hasumoto, J. Urakawa, T. Naito, Y. Tanimoto and E. Shigemasa	
<i>Characteristics of Vacuum Ultraviolet Region Band Pass Photon Detector for Inverse Photoelectron Spectrometer</i>	50
S. Hino, H. Kagitani and K. Iwasaki	
<i>New Apparatuses for Coincidence Measurements towards Understanding Dissociation Dynamics of Inner-Shell Excited Molecules</i>	52
E. Shigemasa, N. Kondo, E. Nakamura and T. Gejo	
<i>Reflectivity Measurements of Cr/Sc and Cr/C Multilayers for Soft X-rays</i>	54
T. Ohchi, S. Wei, T. Fujimoto and I. Kojima	
<i>Optical Characteristics of Mo/Si Multi-layer Evaporated using the Magnetron DC/RF Sputtering System</i>	56
M. Nakamura, T. Murachi, I. Yoshikawa, Y. Takei and A. Yamazaki	
<i>Evaluation of Higher Order Light of the PGM at BL5B</i>	58
M. Sakurai, T. Adachi, T. Hirayama and I. Arakawa	

3. Gas Phase Spectroscopy

<i>Study on Dissociation Processes of Core-excited Methanol using Auger Electron-Photoion Coincidence Measurements</i>	61
Y. Senba, Y. Mishima, M. Morita, Y. Suto, T. Goya, H. Yoshida, T. Gejo, K. Mase and A. Hiraya	
<i>Site-Specific Fragmentation Caused by N:1s Core-Level Photoionization of N₂O Condensed on a Si(100) Surface</i>	62
S. Nagaoka, A. Fujii, S. Tanaka, K. Mase and K. Takahashi	
<i>Pump /Probe Experiments with FEL and SR Pulses at UVSOR</i>	64
T. Gejo, E. Shigemasa, E. Nakamura, M. Hosaka, S. Koda, A. Mochihashi, M. Katoh, J. Yamazaki, K. Hayashi, Y. Takashima and H. Hama	
<i>Molecular and Dissociative Single and Double Photoionization of CS₂ and Ionic Fragmentation of CS₂⁺ and CS₂²⁺ in the Range from 20 to 120 eV</i>	66
T. Masuoka, M. Kato and A. Kobayashi	
<i>UV and Visible Dispersed Spectra from the Extreme UV Photodissociation of the Water Using Synchrotron Radiation</i>	68
K. Mitsuke	

<i>Development of the Apparatus for High-Resolution Dispersed Spectroscopy and Fluorescence Excitation Spectroscopy at BL3A2</i>	70
K. Mitsuke	
<i>Performance of the Conical Energy Analyzer for Angle-Resolved Photoelectron Spectroscopy Developed at BL3B</i>	72
K. Iwasaki and K. Mitsuke	
<i>Formation and Autoionization of a Dipole-Forbidden Superexcited State of CS₂</i>	74
Y. Hikosaka and K. Mitsuke	
<i>Spin-orbit Interaction on Sulfur 2p Photoexcited States of SO₂</i>	76
T. Hatsui, M. Nagasono, H. Oji, N. Kosugi, T. Gejo, E. Shigemasa and T. Ishida	
<i>Sulfur 2p Photoexcited States and Spin-forbidden Shake-up Satellites of CS₂</i>	78
T. Hatsui, M. Nagasono, E. Shigemasa and N. Kosugi	
<i>The First Performance Tests for a Newly Designed Threshold Electron Spectrometer</i>	80
T. Gejo, E. Nakamura and E. Shigemasa	
<i>Angle-resolved Photoion Spectra of NO₂ in the N K-edge region</i>	82
T. Gejo, E. Shigemasa, M. Nagasono, H. Oji, T. Hatsui and N. Kosugi	
<i>Angle-resolved Photoion Spectra of NO₂ in the O K-edge region</i>	84
T. Gejo, E. Shigemasa, T. Hatsui, M. Nagasono, H. Oji and N. Kosugi	
<i>Angle-resolved Photoion Spectra of SO₂</i>	86
T. Gejo, E. Shigemasa, M. Nagasono, H. Oji, T. Hatsui and N. Kosugi	
<i>The Measurement of Absorption Spectra of Trifluoromethyl Sulfur Pentafluoride in VUV Region</i>	88
T. Gejo, E. Shigemasa, K. Takahashi and Y. Matsumi	
<i>Molecular Size Effect on the Site-Specific Fragmentation of the N and O K-shell Excited Oxoalkanenitrile Molecules</i>	90
T. Morita, K. Okada, T. Ibuki, Y. Haga, S. Tanimoto, T. Gejo, K. Saito and K. Ohno	
<i>Study on Dissociation Dynamics of Core-excited Trifluoromethane in the F K-shell Excitation Region using Auger Electron-Photoion-Photoion Coincidence Measurement</i>	92
Y. Suto, H. Yoshida, M. Aratake, Y. Senba, T. Gejo, K. Mase and A. Hiraya	
<i>Fragmentation of the C K-Shell Excited CF₃CN Molecule Studied by Angle-Resolved TOF Mass Spectroscopy: Vibrational Modes Acting as an Internal Energy Reservoir</i>	94
S. Tanimoto, K. Okada, T. Ibuki, K. Saito and T. Gejo	

<i>Ultra-fast Dissociation of Core-Exited Trifluoromethane in the C K-shell Excitation Region</i>	96
H. Yoshida, Y. Suto, M. Morita, Y. Senba, T. Gejo, K. Mase and A. Hiraya	
4. Solid State Spectroscopy 1 (IR, VUV, etc)	
<i>Vacuum-ultraviolet Reflectance Spectroscopy of Transition-metal Oxides</i>	99
Y. Tokura, S. Miyasaka, Y. Taguchi, K. Tobe, K. Ishizuka, T. Saito and T. Arima	
<i>Extreme-Ultraviolet Reflectivity Spectra and Electronic Structures of PbWO₄</i>	100
M. Fujita, H. Yokota, Y. Inabe, M. Horimoto and M. Itoh	
<i>Luminescence of CuI Microcrystals Dispersed in KI Matrix under Matrix Excitation</i>	102
T. Hirai, Y. Harada, S. Hashimoto and T. Itoh	
<i>Photoionization of Adsorbed Rhodamine Dyes at the Aqueous Solution Surfaces</i>	104
T. Ishioka, K. Seno, A. Harata and Y. Hatano	
<i>Fundamental Absorption Edge of PbWO₄ Crystals</i>	106
M. Itoh, H. Yokota, H. Kunisaki and M. Fujita	
<i>Photoluminescence Properties of Hydrogenated Amorphous Silicon Nitride</i>	108
N. Kashio, H. Kato, K. S. Seol, T. Noma and Y. Ohki	
<i>Optical Absorption Bands of Cesium Halides Doped with Tl⁺ Ions</i>	110
T. Kawai, and S. Hashimoto	
<i>Reflection Spectra and Electronic Structure of Forsterite(Mg₂SiO₄) single crystals</i>	112
M. Kitaura, H. Nakagawa and A. Ohnishi	
<i>Observation of New Excitation Channels of Cerium Ion through Absorption by Various Fluoride Host Crystals</i>	114
T. Kozeki, Y. Suzuki, M. Sakai, H. Ohtake, N. Sarukura, K. Shimamura and T. Fukuda	
<i>Optical Spectra of CaAl₂O₄:Eu²⁺ Phosphor thin Film Prepared by PLD Technique</i>	116
T. Kunimoto, K. Kakehi, R. Yoshimatsu, S. Honda, K. Ohmi and S. Tanaka	
<i>Intrinsic Luminescence in (C₂H₅NH₃)₂CdCl₄ Single Crystals</i>	118
A. Ohnishi and M. Kitaura	
<i>Luminescence due to Relaxed Excitons in Orthorhombic SnCl₂</i>	120
N. Ohno, and K. Sasaki	
<i>Photoluminescence of CsSnCl₃ Crystal</i>	122
N. Ohno and K. Sasaki	

<i>Two-Photon Spectroscopy of Core Electrons in BaF₂ with Synchrotron Radiation and Laser</i>	124
T. Tsujibayashi, J. Azuma, K. Hayakawa, M. Itoh, M. Watanabe, O. Arimoto, S. Nakanishi, H. Itoh and M. Kamada	
<i>Photoinduced Change at VUV Reflection Spectra of Amorphous Chalcogenide Films Induced by BG Light</i>	126
K. Hayashi	
<i>Magnetic Kerr Rotation Measurement on Ni around Its M_{2,3} Edges</i>	128
K. Saito, M. Igeta, T. Ejima, T. Hatano and M. Watanabe	
<i>Magneto-Optical Study on Electronic Structure of Ce_{1-x}La_xSb (x = 0, 0.1) in the Infrared Region</i>	129
S. Kimura, T. Nishi, H. Iwata, M. Okuno, H. Kitazawa and G. Kido	
<i>Far-infrared and Millimeter Wave Spectra of Iodide Doped Silver Phosphate Glass</i>	130
T. Awano	
<i>Infrared Transient Absorption Obtained from the Combined Laser-SR Experiment</i>	132
J. Azuma, M. Iwanaga, M. Watanabe, M. Kitaura, M. Itoh and M. Kamada	
<i>Optical Response of Cu_{1-x}Zn_xIr₂S₄ Due to Metal-Insulator Transition</i>	134
L. Chen, M. Matsunami, T. Nanba, G. Cao and T. Matsumoto	
<i>Temperature-Induced Valence Transition of EuNi₂(Si_{0.25}Ge_{0.75})₂ Studied by Eu 4d-4f Resonant Photoemission and Optical Conductivity</i>	136
S. Kimura, M. Okuno, H. Iwata, T. Saitoh, T. Okuda, A. Harasawa, T. Kinoshita, A. Mitsuda, H. Wada and M. Shiga	
<i>Millimeter Wave Reflection Measurements of LiNiO₂ Using UVSOR and Coherent SR</i>	138
H. Ohta, K. Kawakami, Y. Nagasaka, T. Nanba, A. Hirano, R. Kanno, T. Takahashi and T. Matsuyama	
<i>Excitonic Properties of Lead-Halogen-Based Self-Organized Low-Dimensional Crystals</i>	139
K. Tanaka, T. Takahashi and T. Kondo	
<i>Infrared Magnetic Circular Dichroism in the Colossal Magneto-Resistance Pyrochlore Tl₂Mn₂O₇</i>	140
H. Okamura, T. Koretsune, M. Matsunami, S. Kimura, T. Nanba, H. Imai, Y. Shimakawa and Y. Kubo	
<i>Transmittance Spectra of GaAs and GaP in Far-Infrared Region</i>	142
I. Shoji and T. Taira	

<i>In Situ Measurement of Luminescence from Silica Glass under Soft X-ray Irradiation</i>	144
T. Yoshida, T. Tanabe and H. Yoshida	
<i>Luminescence Spectra of AlGa_N Thin Films</i>	146
K. Fukui, K. Ebisu, S. Oda and K. Kimura	
<i>Responsivity Spectra of GaN Based UV Detectors in VUV Region Using Transparent Electrode</i>	148
A. Motogaito, K. Ohta, K. Hiramatsu, Y. Ohuchi, K. Tadatomo, Y. Hamamura and K. Fukui	
<i>Luminescence Decay of Ce-doped GSO under Excitation of VUV with Energy less than 30 eV at Room Temperature</i>	150
S. Shimizu, A. Ejiri and S. Kubota	
<i>Extreme Ultraviolet Faraday Rotation Spectra of Co / Pt Multilayers on Collodion Films</i>	152
M. Igeta, K. Saito, T. Ejima, T. Hatano and M. Watanabe	
5. Solid State Spectroscopy 2 (XAFS, PES, etc)	
<i>Structural Analysis of Amorphous Al₂O₃-Y₂O₃ Films</i>	155
N. Ozawa, T. Yao and T. Hanada	
<i>La 3d-edge Photoabsorption and Resonant Photoelectron Spectroscopy of Rare-earth Borocarbide LaB₂C₂</i>	156
H. Oji, S. Hasegawa, K. Suzuki and N. Kosugi	
<i>Anisotropic Absorption Spectra of Polyester Films due to Valence Electrons in Shallow and Deep Levels</i>	158
I. Ouchi, I. Nakai and M. Kamada	
<i>Orientation of Ammonia on ZnO(10$\bar{1}$0)</i>	160
K. Ozawa, T. Hasegawa, K. Edamoto, K. Takahashi and M. Kamada	
<i>Resonant Photoemission Study for Spin-Crossover Complex [Fe(2-pic)₃]Cl₂EtOH</i>	162
K. Takahashi, T. Tayagaki, K. Tanaka and M. Kamada	
<i>PES and NEXAFS Studies of DNA Polynucleotides on Silicon Dioxide Surfaces with and without Iodine Doping</i>	164
M. Furukawa, H. S. Kato, M. Taniguchi, T. Hatsui, H. Oji, T. Komeda, T. Kawai, N. Kosugi and M. Kawai	
<i>N 1s Photoabsorption of N₂ Trapped in Rare Gas Matrices</i>	166
M. Nagasono, H. Oji, T. Hatsui, E. Shigemasa and N. Kosugi	

<i>B 1s- and La 4d-edge Photoabsorption and Resonant Photoelectron Spectroscopy of Rare-earth Borocarbide LaB₂C₂</i>	168
H. Oji, S. Hasegawa, K. Suzuki and N. Kosugi	
<i>Surface Photovoltage Effects on n-type GaAs Studied with Combination of SR and Laser : Temperature Dependence</i>	170
S. Tanaka, K. Takahashi, J. Azuma and M. Kamada	
<i>Surface Photovoltage Effects on n-type GaAs Studied with a Time-Resolved Photoelectron Spectroscopy</i>	172
S. Tanaka, K. Takahashi, J. Azuma and M. Kamada	
<i>Surface Photo-voltage Effect on GaN(0001) Studied by Photoemission Spectroscopy with the Combination of SR and Laser</i>	174
K. Takahashi, K. Hayakawa, S. Tanaka, J. Azuma, M. Itoh and M. Kamada	
<i>XAFS Study at Si K-edge on Several Types of Zeolites</i>	176
H. Aritani, Y. Fujimura, C. Karatani, T. Murakami, K. Eguchi, M. Tamai and A. Nakahira	
<i>Characterization of Mn_{1-x}Mo_{2x}V_{2(1-x)}O₆ as anode for Li Secondary Battery by Mo, V and Mn L-XANES</i>	178
D. Hara, Y. Uchimoto, H. Ikuta and M. Wakihara	
<i>Al K-edge XANES of Surface Treated Natural Graphite by Aluminum</i>	180
S. S. Kim, Y. Kadoma, H. Ikuta, Y. Uchimoto, and M. Wakihara	
<i>Mg K-edge XANES Study of Cu-MgO/TiO₂ Oxide for Bactericidal Materials</i>	182
T. Kosaka, A. Yamada, Y. Hayasi and S. Hasegawa	
<i>Characterization on the Surface of Polymer Ultra Thin Films Impregnated with Ruthenium-Polybipyridine Complex by XAS</i>	184
S. Matsuo, T. Kurisaki, H. Yamashige and H. Wakita	
<i>Zn-L₂₃ Absorption Spectrum from MgO-ZnO Solid Solutions</i>	186
T. Mizoguchi, M. Kunisu, M. Matsui, I. Tanaka, H. Adachi, T. Yoshida, H. Yoshida, S. D. Mo and W. Y. Ching	
<i>Microstructural Control of Calcium Titanates with Some Oxides as a Dopant and Analysis of their Local Structure by Ca K- and P K-edge XAFS</i>	188
A. Nakahira, K. Eguchi, C. Karatani, Y. Honda, T. Murakami and H. Aritani	

<i>An Electronic Study on the Analysis of Al K X-ray Absorption Near Edge Structure for on Aluminum Adsorbed Ion-exchange Resin</i>	190
K. Shirozu, S. Matsuo, T. Kurisaki, T. Yokoyama and H. Wakita	
<i>Ultraviolet Photoelectron Spectra of Surface Lattice Oxygen of LiNiO_2</i>	191
T. Miyazaki, D. Yoshimura, K. Kamiya and T. Yamaguchi	
<i>Mg K-Edge XANES Study of Crystallization of MgAl_2O_4 Spinel Prepared from A Mixture of $\text{Al}(\text{OH})_3$ and $\text{Mg}(\text{OH})_2$ Activated Mechanically by Wet Milling</i>	192
T. Shiono, T. Minagi, H. Aritani, S. Okumura and T. Nishida	
<i>Mo and Mn L-XANES of MnMoO_4 for high capacity anode material of Li secondary battery</i>	194
Y. Uchimoto, S. Ogura, H. Ikuta and M. Wakihara	
<i>Intermolecular Energy-Band Dispersion in Well-Oriented PTCDA Multilayer by Angle-Resolved UV Photoemission</i>	196
S. Kera, S. Tanaka, Y. Yabuuchi, T. Mori, H. Yamane, D. Yoshimura, K. K. Okudaira and N. Ueno	
<i>Characterization of the Diamond-like Carbon Films Formed by Ar Gas Cluster Ion Beam Assisted Deposition</i>	198
T. Kitagawa, K. Kanda, Y. Shimizugawa, Y. Haruyama, S. Matsui, M. Terasawa, H. Tsubakino, I. Yamada, T. Gejo and M. Kamada	
<i>Effect of Oxygen Partial Pressure on Electronic Structure of $(\text{La},\text{Sr})(\text{Co},\text{Fe})\text{O}_{3-\delta}$ Evaluated from Transition Metal L-edge and O K-edge XANES</i>	200
A. Mineshige, M. Kobune, S. Fujii and Y. Uchimoto	
<i>Electronic Structure Change by Li Deintercalation in $\text{Li}_x\text{Co}_{1-y}\text{Mn}_y\text{O}_2$ from Co-L, Mn-L and O-K XANES</i>	202
N. Ozawa, Y. Uchimoto, H. Sawada and T. Yao	
<i>Electronic Structure of Ionic Liquids Studied by UV Photoemission</i>	204
D. Yoshimura, T. Yokoyama, T. Nishi, H. Ishii, K. Seki, R. Ozawa and H. Hamaguchi	
6. Surface and Photochemistry	
<i>SR Etching of SiO_2 Using a Contact Cobalt Mask</i>	207
C. Wang, Z. Wang, S. More, Y. Nonogaki, S. Yamamura, S. Fujiki, M. Takizawa and T. Urisu	
<i>Ion Desorption from the $\text{SrTiO}_3(100)$ Surface</i>	208
S. Tanaka, K. Mase and S. Nagaoka	

<i>Reactivity of the Nearly Ideally H-terminated Si(100)-2×1 Surface with Water</i>	210
Z. H. Wang, H. Wanatabe, S. Nanbu, J. Maki, M. Aoyagi , K. Ooi and T. Urisu	
<i>Nearly Ideally Hydrogen Terminated Si(100) Surface and IR-spectrum Width Broadening Due to Hydrogen Diffusion into the Subsurface</i>	211
Z. H. Wang, N. Yabumoto and T. Urisu	
<i>Local Atomic Arrangement of Si(111) $\sqrt{3}\times\sqrt{3}$-(Pb,Sn) Surface</i>	212
J. Yuhara, T. Takada, D. Nakamura, K. Soda and M. Kamada	
<i>Measurements of Total Yields of Exciton-Induced Desorption from Argon Films Condensed on Solid Neon</i>	214
T. Adachi, T. Hirayama, I. Arakawa and M. Sakurai	
<i>Deposition of Carbon Film Using Synchrotron Radiation Ablation</i>	216
H. Nagai, M. Hori, T. Goto, K. Katou, K. Ito and M. Hiramatsu	
<i>Formation of Polytetrafluoroethylene Microstructures by Synchrotron Radiation</i>	218
H. Okada, E. Matsumoto, H. Yamada, A. Wakahara and A. Yoshida	
<i>Characteristics of Polytetrafluoroethylene Films Deposited by Synchrotron Radiation</i>	220
A. Yoshida, E. Matsumoto, H. Yamada, H. Okada and A. Wakahara	
<i>Silicon Oxide on Si (001) Surfaces Removed by SR Stimulated Desorption</i>	222
Y. Nonogaki and T. Urisu	
Publications	223
Workshops	231
Appendix	235